Striped hyaena Research Project – Ethiopia

Project description

Project Start Date: to be determined

Fieldwork Start Date: to be determined

Fieldwork End Date: to be determined

Project End Date: to be determined

Primary Fieldwork Location Country or Area: Central and Eastern Ethiopia

Secondary Fieldwork Location Country or Area: Central and Southern Ethiopia

Time Required for the Conservation Survey: 50 days

Time Required for the Educational Campaign: 10 days

Time Required for the Data Collection: 10 days

Total Time Required for the Execution of the Project: 60 days

Fieldwork Latitude: 10,53773

Fieldwork Longitude: 40,87786

Primary focus of the Project: Conservation

Secondary Focus of the Project: Education

Lens: Wildlife

Field of Study for the Project: Anthropology; Biodiversity Conservation; Comunication;

Cultural Studies; Ecology; Education, Scientific Disciplines; Folklore; History; Imaging Science & Photographic Technology; Literature; Social Sciences, Interdisciplinary; Zoology.

Project Summary: The project aims to investigate the conservation status of the striped hyaena (Hyaena hyaena) in Ethiopia and its perception in popular culture. It includes a Conservation Status Survey and an educational campaign on the territory. The educational campaign will be conducted in high schools through the implementation of educational methodologies and by investigating relationships between hyaenas and local communities, in order to educate new generations and explain to them the ecological role of scavengers. In education the project also aims to differentiate genera and related species of the Hyaenidae family in an attempt to correct misperceptions. Starting from an analysis of anthropological and cultural factors, the project intends to demonstrate how social considerations influence the striped hyaena conservation status, making the species vulnerable and exposed to the risk of extinction. The Conservation Status Survey will be conducted in specific areas of Central, Eastern, Southern Ethiopia and nearby mountains and will try to promote a better understanding of the target species in the country. The project intends to provide information about the species that could move public opinion. All expected outputs are aimed to increase the striped hyaena conservation measures in Ethiopia to eventually be used to create a Striped Hyaena Conservation Area.

Qualifications or credentials relevant to this project: ten-year teaching experience in Higher Education Institutes. Experienced in archaeological excavations with *La Sapienza* University, Rome. Internship in Archeology and Prehistoric art lab (educator and tour guide) in *Luigi Pigorini Prehistoric-Ethnographic Museum,* Rome. Experienced in data collection for BIASA *Archeological Institute,* Rome. Training and educational project manager in Higher Education Institutes. AIEA (Associazione Italiana Esperti Africa) certification of field-guide (level 1) and *Focus on African Mammals,* certificate of accomplishment. Experiences in self-drive safari and field research on hyaenids in African and Middle East countries (Namibia, South Africa, Tanzania, Turkey, Ethiopia, Morocco, Tunisia, Oman, Jordan, Georgia, Iran).
Personal interest in hyaena studying in literary sources, scientific journals, magazines and IUCN/SSC publications (CV attached for details). The project is supported by Giuseppe Mazzotta (WWF President of Sicily and Mediterranean Coast) as Project Supervisor, local operators and by personal funds.

Total Project Budget: € 42,000.00

Project Creator Information

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Project Members:

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Local collaborator: Ylikal Bekele Tiruneh, Professional Tour and Field Guide

Project Details

Background and Relevance

The striped hyaena evokes many superstitious fears because of reputed and documented cases of injuries to humans, killing of children and grave robbery. The species is widely exploited as an aphrodisiac, and often illegally killed because of supposed medical properties, therefore high prices are paid to be traded on the black market (Cuzin 1996). The species is also persecuted because of suspected or real damage inflicted on agricultural produce and livestock. Indigenous cultures and folklore have always attributed magical properties to hyaena body parts used in witchcraft (Canaan 1927; Fitter 1978; Rieger 1978; Prater 1948; Brosset 1960; Bellakhdar 1997; Frembgen 1998). The false beliefs about the hyaena's deadly nature and the contempt towards its eating habits have led to an indiscriminate persecution with an a regression in the species throughout its range (Hofer-Mills 1998b). Causes of mortality are poisoning, poaching, acts dictated by generalized hatred towards the species, depletion of food sources, combat sports and hunting by nomads (HoferMills 1998, l. Khorozyan, A.Malkhasyan, M. Murtskhvaladze, 2011).

In Ethiopia the Regional Conservation Status is listed by IUCN as *near threatened* with a population estimate of about 100 individuals (Hofer-Mills 1998). The species is specially protected under Schedule of the Ethiopian Wildlife Conservation Amendment Regulations (1974), however may be hunted under special permit. The last reliable studies on the striped hyaena in East Africa date to Kruuk (1976) and Wagner (2006), subsequently summarized in *Hyaenas, Status Survey and Action Plan* by IUCN/SSC Hyaena Specialist Group. The current distribution in several areas is unkonwn and based on old records that would require confirmation and no recent monitoring studies have been further carried out in the country. Because species is poorly recognised there is little reliable information from areas other than conservation areas (J.C. Hillman pers. comm.). Scattered subpopulations may still be present into the wild.

The species is endemic to Ethiopia and presents some differences in its subspecies *Hyaena hyaena dubbah* (Meyer 1793:94). Historically widespread (Yalden et al. 1980, 1996) it has a continuous distribution over larger areas (Hofer & Mills 1998) in the country. IUCN records indicate the occurrence of the species in Central Ethiopia, in the Awash Area included the Mile Serdo Wildlife Reserve, Yangudi Rassa National Park, Awash National Park and Aledeghi Wildlife Reserve. Literary sources indicate the occurrence of the species also in the central-western area, in Maze National Park (Bocale-Borghetti 2002). Recent conservation surveys by LCSE *Large Carnivore Survey of Ethiopia* in collaboration with EWCA *Ethiopian Wildlife Conservation Authority* have recorded sightings through locally placed camera traps in the Eastern part of the country, in Babille Elephant Sanctuary, south of Harar city. In the Southern part of the country the species occurs in Yabelo Wildlife Sanctuary, Omo National Park and Mago National Park (Baba et al. 1982).

The biology of the species in most contexts is poorly understood (Wagner, Frank, Creel 2008). Despite the wide occupied range of striped hyaena, natural densities are low and the remaining distribution is highly fragmented and divided into many isolated populations (Wagner 2006). The assessment of the current status and population trends of the striped hyaena is complicated by several problems. It occurs at low densities and because its nocturnal and solitary habits often in rugged country sightings are infrequent and surveys difficult to carry out. IUCN data suggest that the striped hyaena is already extinct in many localities and that populations are generally declining throughout its range. The main causes are decreasing natural and sources of carrion due to declines in the populations of other large carnivores and their prey, and changes in livestock practices. Moreover, the low densities and associated large home ranges are likely to increase the chances of fragmentation of populations into small, non-viable units (Hofer & Mills 1998).

Goals and Objectives

The project plans to carry out a study report on the *Hyaena hyaena* species in Ethiopia. It will be developed simultaneously with two focus: the former in conservation, the latter in education. In conservation, the project aims to investigate the status and the current distribution of striped hyaena in areas of the country in which records (published in the last Action Plan by IUCN/HSG) indicate the occurrence of the species and to expand information on the remaining populations. In education, aim of the project is to make new generations aware of the matter and test the state of knowledge on the striped hyaena (*Hyaena hyaena*) in the investigated areas of Ethiopia. The project expects to reduce disrespect and generalized contempt towards hyaenas and to improve knowledge on the Hyaenidae family in schools and among local communities in order to verify potential changes in collective perception. It aims to raise awareness about possible consequences of careless human actions on natural resources and to encourage forms of cooperation that could bring tangible benefits for economic growth in the country. The educational campaign will be based on presentations, school lessons, interactions with students and interviews with local people. Through the use of educational methodologies and analogical connections the project wants to illuminate causes affecting population decline in species such as superstition, persecution, extermination, hunting and preconceptions about the species. This project intends to create conditions that allow humans to better coexist with hyaenas. In schools, it intends to provide correct information and to compare the behavioral traits of striped hyaena together with the related species of the Hyaenidae family in order to increase the knowledge on the species in an attempt to improve collective perception. The project wants to further illustrate the human/hyaenas conflicts and investigate the causes of mortality by recording data from interviews with students and local communities. The field research aims to promote the development of striped hyaena conservation measures in the investigated areas. In the future, this project would aim to identify new study areas where conservation actions would need to be reinforced.

Overall teaching objectives are:

1. Conservation Status Survey of the striped hyaena (*Hyaena hyaena*) in the selected areas of Central, Eastern and Southern Ethiopia and investigation on the Regional Conservation Status in IUCN Red List Categories.
2. Update of records on the striped hyaena distribution map in the selected areas of Central, Eastern and Southern Ethiopia.
3. Improvement in the hyaena collective perception and differentiation between genera and related species of the Hyaenidae family among students in selected high schools and local communities in rural areas (lessons will help students understand the consequences of human actions on terrestrial fauna, the resultant drivers of population decline in species, to educate towards peaceful coexistence with hyaenas, reduce misperceptions, refute medical uses of hyaena body parts, decrease popular beliefs and evaluate the perceptual impact on hyaena populations).
4. A report on the target species with an anthropological and cultural study and a literature overview on the striped hyaena (Hyaena hyaena) in Ethiopia.

The field research aims to investigate areas of Central, Southern and Eastern Ethiopia where the species seems to occur in order to draw a map with updated records that could contribute to offer new study data. The conservation species plan has to include furthermore parallel

actions aimed to the reinforcement of final conservation measures and goals: increasing of safeguard regional levels; a rigorous control activity for areas where species still occurs (the monitored remaining populations would be therefore subject to management measures). The team will provide study data and information about the hyaena. The final productions will be used to turn attention back to the striped hyaena, *Hyaena hyaena* between local, International Institutions and bodies. All expected outputs will be used in support of the Ethiopian Wildlife Conservation and of the scientific research in East Africa.

Methodology detail

The educational campaign will be developed in high schools and International Institutes selected through a specific research conducted by the team according to the advice of the local operator. The educational methodology will be based on visual languages that will help students understand the main differences between hyaena' genera and species, stimulate reflection on human actions and induce respect for wildlife. Due to difference in languages in the country, the used methodologies will be based on visual language according to the specific cases (frontal lesson, analogical connection, case study, cooperative learning group). Different learning tools will be provided to analyze different cases: literary sources, tables with drivers of decline in species, illustrations or, wherever possible, short films. Leaflets with brief statements and illustrations will be used to develop the capacity of analogical connection and to reinforce educational methodologies towards a conservation approach. Experiences from other countries will be provided to show in which way the development of natural resources has led to economic improvements (e.g., growth in tourism, establishment of nature conservancies and accommodation facilities). During the field research, interviews with local people will aim to verify the knowledge on the species, collect data about the causes of population decline in species and promote collaboration.
People from rural communities will be interviewed in order to try to decrease the conflict between herdsmen, farmers, nomads and hyaenas by explaining how they could obtain ecological benefits from them in a natural way (e.g., hyaenas could be used as a natural "waste disposal" by eating animal remains and cattle dead from disease or other natural causes), or how the presence of hyaenas could promote a form of touristic attraction through the establishment of Protected Areas. The educational strategies will be developed starting from considerations of economic nature focusing on the potentialities of the territory, towards the hypothetical development of ecotourism forms for economic growth in the country and will be implemented through conservation actions (cooperation and involvement in the research, results comparison). The data collection will be used to differentiate the causes of population decline in species (persecution, poaching, hunting, poisoning, blood sports, illegal trafficking, resource dispersion, road kills etc.). At the end outputs will be summarized in numerical values and tables showing the results regarding people from different backgrounds (e.g., by reporting known cases of killing of hyaenas and specific reason).
The conservation status survey will be primarily conducted in National Parks, Protected areas and territories in need of conservation through interactions with local people. Time required to achieve results will be based on weather conditions and morphological characteristics of the territory (remaining days will be used to collect data and process reports). The survey will require longer times to conduct the research, due to moving difficulties on impervious territories. The field research will focus on semi-desert areas and

mountain regions rich in natural caves (the species has been spotted to an altitude of 2.700 m. in Toubkal Mountain Range, Central Morocco - Cuzin 2003) and on animal trails in order to identify forage sites and burrows. The conservation status survey will be based on tools like locally placed digital cameras and photo traps that will allow confirmation of records in the investigated areas or to collect data on the declining populations. Simple, non-invasive, cost-effective and sustainable detection methods will be used in order to identify specimens to study and possibly to film. Scent marking signs (pasting), feces and footprints will be analyzed during the conservation survey. The field research will be mainly carried out at night time and early morning because of the crepuscular and elusive habits of the striped hyaena. Photo traps will be placed in strategic zones and sighting points (waterholes, wadis, dry riverbeds). The identification of natural shelters, dens and forage sites could allow assessment of the assumptions concerning the poorly known diet of striped hyaena (vegetarian, carrion diet or any hunting activity). In this regard the team will make use of scat analysis to confirm its survival in areas where there is no competition with other large carnivores and hyaenas cannot therefore feed on leftovers (Kruuk surveys 1976 - verified that, in Serengeti, striped hyaena excrements contained a small amount of calcium due to the higher portion of vegetarian diet in the Hyaena hyaena species). The team will try to assess possible identifying marks between the remaining specimens about size, coloration, coat texture, striation. Data will be collected and summarized in appropriate tables at the end of each survey on territories.

Relevant outputs

The final results of the project will be:

1. The update of the striped hyaena Regional Conservation Status and the production of a spreadsheet with new records for the selected areas of Ethiopia (see the list of the investigated areas and National Parks in the project map).
2. The new distribution map with the sighting records of the target species for the investigated areas of Central, Eastern and Southern Ethiopia.
3. The improvement in hyaena collective perception in society's cultural outlook by using educational methodologies and the differentiation in knowledge among genera and related species of the Hyaenidae family in selected high schools and International Institutes.
4. A special final report on the striped hyaena (*Hyaena hyaena dubbah*) in Ethiopia.
   The study report should contain:
   1. One dissertation about the causes of population decline in species affecting the conservation status of the striped hyaena (results comparison will determine a statistics for the study of cultural factors that affect the image of hyaena and it will show the drivers in population decline in species and in hyaena mortality).
   2. A general literary overview on the striped hyaena in the country and an anthropological-cultural study obtained through the data collection of personal experiences (questionnaires in schools and interviews in rural areas).
5. Production of a feature length film about the striped hyaena in Central, Eastern and Southern Ethiopia.

Dissemination of project results

The project wants to address the problem to schools, Governing bodies, Ministries of the Environment, Institutes of Scientific Research, local researchers etc. and hopefully, to disseminate the project results by implementing conservation actions promoted by Nature Conservancy Foundations. The project aims to spread information on the topic through awareness-raising campaigns, educational learning programs in cities and town schools, interaction and cooperation with local communities. The strategic planning of the work program will take place through collaboration with local researchers, WWF collaborators and conservation bodies. Successively the results dissemination will be disclosed through the Project Creator personal website www.vincenzocohen.com, contents shared in publications, web networks promoted by the team, Media and relevant Institutions that have joined the project. The outcomes of the both two focus areas will be collected in thesis, reports, maps and spreadsheets that could permit to expand information and extend the project to other regions of Ethiopia and possibly other countries. Final reports will be carried out with all the acquired data in order to complete and update the conservation status of the target species and facilitate the disclosure of the contents to the researchers.

Monitoring/Evaluation/Current basilines

In both the focus Areas data collection will be formulated through detection parameters, monitoring and evaluation indicators that allow the acquisition of information and measurable values.
SPECIES INDICATORS: taxa definition; identification signs in species (size, striation pattern, coloration, sagittal crest, coat texture); specific behavior (competition, commensalism, saprophagy, denning behavior, mating behavior, scent marking).
MONITORING INDICATORS AND DETECTION PARAMETERS: date of detection; geographic coordinates; habitat type (territory features); time of sightings (season period, hour of sighting); unit of measure (number of sightings, total number of individuals, number of male individuals, number of female individuals, number of cubs, number of young individuals, number of adult individuals, number of old individuals, number of sick individuals, number of specimens with differentiation signs, number of dens).
DETECTION CRITERIA: photos, photo traps, videos, observations, pawprints analysis, marking signs analysis, scat analysis.
CONSERVATION STATUS INDICATORS: presence/absence of species into the wild; presence/absence of species in protected areas; number of sightings into the wild; number of sightings in protected areas.
INDICATORS OF DECLINE: causes of population decline in species (persecution, poaching, preconceptions due to cultural heritage, etc.), causes of mortality in species (lack of livelihood, lack of prey, lack of forage sites, etc.); areas at risk of degradation (human presence or coexistence, agricultural exploitation, urban expansion, pollution).
DISTRIBUTION INDICATORS (mapping): number of sightings; number of individuals; distribution of sightings; number of resident groups; number of resident pairs, number of resident groups before and after the survey, number of solitary individuals.
As regards the educational campaign: the involved recipients will be students in schools (150/180 students) and rural communities, indirectly affected by the campaign.
DETECTION PARAMETERS: direct surveys, questionnaire-surveys, single or group interviews, reports, observations.

MONITORING INDICATORS AND UNIT OF MEASURE OF MONITORING ACTIVITIES: number of involved human subjects, number of dedicated hours, number of administered cards, number of realized meetings.
IMPACT ANALYSIS: we will measure the impact of the educational campaign among the involved students in order to understand if the campaign is able to modify the knowledge of the hyaena and its perception (output indicators). If a significant percentage among all students shows an improvement in the general hyaena perception (because of a better result is shown in their final tests compared to their previous knolewdge) this can help to promote greater awareness (result indicator) among the recipients and spread a better knowledge of the topic in students' communities. Starting from new data, the result will consist in a reinforcement of the conservation actions aimed at the economic and tourist growth (impact indicator). Similar procedures will be used in rural areas during the field research. Interviews aimed to test the hyaena perception will be carried out between rural communities to verify potential changes in collective hyaena perception. Final results will be summarized in a table showing the drivers of population decline in species.
The data collection in both focus areas will be carried out taking into account cost control and activity monitoring. Cost control will be necessary to monitor the cost of the outputs in order to reach the expected results.

External Capacity Development

The project aims to identify key-factors such as hostility, superstitions, misperceptions and cultural heritage that may influence collective perception and compromise the image of striped hyaena in society (reports on striped hyaena hunting activity are cited in relevant literary sources - Valverde 1957, Hufnagl 1972, Osborn & Helmy 1980, De Smet 1988, Kowalski & Rzebik-Kowalski 1991, Dragesco-Joffe 1993, Mills & Hoffer 1998, Saleh & Basuoni 1998. Furthermore the corpse digger' reputation of the striped hyaena is much diffused and based on observations - Hufnagl 1972, De Smet 1988, Dragesco-Joffé 1993; in North Sahara during premarital rite, brides consume the heart of hyaenas to gain strength - personal spoken testimony 2014). The project aims to plan a cooperative learning program that could stimulate the development of awareness regarding safeguard of the target species. Students involved in the project will benefit by improving their knowledge and perception about hyaenas thanks to active participation in lessons and through the use of different learning and educational tools. As for villages and rural communities, the use of collaborative strategies will be useful to increase knowledge and raise awareness by joining forces in the target species conservation plan. During the conservation survey, local collaborator and members of communities may be active part by contributing with study information about territory and hyaenas by reporting on sightings points, tracks on the ground (feces, scent marking signs, pawprints) or by informing on hyaena presence nearby water pools, dens and on crossing routes of moving animals. The development of awareness by students at school and by local communities in villages and rural areas shall be helpful to the implementation of conservation measures, as for the decreasing of superstitions regarding the target species (Hyaena hyaena) in Ethiopia.

Observations

Social system in the species, *Hyaena hyaena*

In 2003 a study on the social system through spatial group formation in striped hyaena was conducted with RDH method (Resource Dispersion Hypothesis - Carr & MacDonald 1986) in Laikipia district, Kenya by A. Wagner, L. G. Frank and S. Creel. Study data have described a new social organization not exhibited by any other species within the Carnivora.
The survey has shown that striped hyaenas are behaviorally solitary, but live in stable spatial groups consisting of multiple males and a single adult female. The formation of these spatial groups in the species seem explained by an interactive relationship between diet, foraging behavior, and the influence of female territory size on the ability of males to defend access to females (Wagner, Frank, Creel, 2006). Diet and dispersion of food sources are widely recognized as the key determinant of group formation (Crook 1965; Alexander 1974; Wilson 1975; Gittleman 1989; Mills 1989) and should influence group size and individual distribution. When ranges are shared, group structures and social interactions should reflect a balance between fitness costs and payoffs to behaviors such as the formation of cooperative males coalitions to defend access to mate (Caro 1984) or cooperative hunting groups (Creel & Creel 1995). It is known that striped hyaena diet includes a wide variety of small food items (e.g. small vertebrates, invertebrates, vegetables and fruit), as well as scavenged items by other large carnivores (lions, spotted hyaenas kills - Ilani 1975; Kruuk 1976; MacDonald 1978; Wagner 2006). With a food resource base consisting of scarce food sources, RDH models show that female striped hyaenas remains strictly solitary. If the female distribution drives the males ones, consequently also male individuals will be solitary in response to female over-dispersion. Observations by survey in Laikipia have demonstrated that solitary foraging and feeding is favoured in both sexes of striped hyaenas because due to depletion of food sources there are no benefits to group foraging to offset local feeding competition, consequently grouping is not promoted. Spatial group size are limited by prey availability (Waser 1981; MacDonald & Carr 1989), while foraging group size is linked to the ability in hunting activity (Gittleman 1989). In other carnivorous species differences in the size of feeding and foraging groups can occur when large prey items or rich in food patches permit formation of feeding groups. Striped hyaenas do not form large feeding groups even when large prey items are available. It has been shown that several striped hyaenas may visit the same carcass over a long period, but temporal spacing maintains solitary feeding (Wagner 2006). These observations contrast to feeding group formation recorded for the species in Israel (MacDonald 1978). In this study area, striped hyaenas were specifically cited as a case where a clumped food resource may have allowed for large spatial groups (MacDonald 1978; Mills 1989; Gittleman 1989). Study observations in East Africa seem instead to prove that more resources did not produce social foraging, despite the existence of spatial groups (Kruuk 1976, Wagner 2006). While female distributions arising from access to food sources for herself and her offspring, the spacing pattern of males is adapted to the distributions of both, food and female (Jarman 1974) because males compete for access to mate (MacDonald 1983; Johnson *et al.* 2002). While in other species male coalitions are formed to defend multiple females, in striped hyaena, defence of multiple females are not necessary for male coalition formation: groups of males cooperate to defend a territory containing a single female. If the female striped hyaenas are forced to maintain larger home-ranges because of the number of males within their territories, females do not receive benefits from resident males in terms of costs. Striped hyaena males do not spend significant period of time at den site (Davidar 1990,

Wagner, 2006) and this should lead to the conclusion that there is no evidence that common forms of paternal care occur, beyond territorial defence.
In summary, the essential polyandrous spatial organization of striped hyaenas, combined with little social interactions, seems to be unique among the Carnivora (Wagner 2006).

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Expected Outputs

Category	Result and number of productions	Description (details)
Academic outputs	Species studied (1)	Production of a study report on the striped hyaena *Hyaena hyaena dubbah.*
Education	Students (Advanced or Higher Education)	Improvement in hyaena collective perception. Expansion of general knowledge about Hyaenidae family. Differentiation in genera and related species.
Public Communications Products	Dissertations or theses (1)	Production of an anthropological and cultural study on the striped hyaena (*Hyaena, hyaena*) in Ethiopia.
Public Communications Products	Magazine or newspaper article published, dissertations or theses (1)	Investigation on drivers of population decline in species.
Public Communications Products	Maps and geovisualizations data (1)	Updating of the map of records in investigated areas of Central Eastern and Southern Ethiopia
Public Communications Products	Feature Length Film (1)	Striped hyaena (*Hyaena hyaena*) research on the territory (movie).

Public Communications Products	Photography (to be determined)	Striped hyaena (*Hyaena hyaena*) research on the territory (pictures).
Public Communications Products	Open-source datasets, sample sets, methodologies, tools, software, etc. (1)	Striped hyaena (*Hyaena hyaena*) conservation status survey in investigated areas of Central, Eastern and Southern Ethiopia (spreadsheet).